

REMARKS

In response to Applicants' response filed November 17, 2006, Examiner stated in the Advisory Action that the arguments and amendments raised new issues. Applicants hereby file an RCE resubmitting the previously filed arguments and amendments.

Claims 1, 4, 8, 10-12, 20-22, 25, 29, 31-33, 40-42, 45, 49, 51-53 and 60 are pending. In the Office Action dated September 7, 2006, the Examiner took the following action: (1) objected to the drawings; (2) rejected claims 1, 8, 10-12 and 20 under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art (figures 3A and 3B) taken together with U.S. Patent No. 6,096,250 to Chen ("Chen"); (3) rejected claim 4 under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art taken together with Chen as applied to claims 1, 8, 10-12 and 20 above, and further in view of U.S. Patent No. 4,862,586 to Osada ("Osada"); (4) rejected claims 21, 29, 31-33, 40-41, 49, 51-53 and 60 under 35 U.S.C. § 103(a) as being unpatentable over Japanese Patent No. 02-148816 to Kurihara et al. ("Kurihara") taken together with Chen; and (5) rejected claims 22, 25, 42 and 45 under 35 U.S.C. § 103(a) as being unpatentable over Kurihara taken together with Chen as applied to claims 21, 29, 31-33, 40-41, 49, 51-53 and 60 above, and further in view of Osada.

Interview Summary

An interview was conducted between the Examiner and Applicants' representative on December 13, 2006. Applicants discussed differences between proposed amendments to the claims and the art of record. Examiner agreed that the proposed amendments would distinguish over art of record and would be allowable if further search failed to find relevant art.

Discussion of the Disclosed Embodiment

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

One disclosed embodiment includes an improvement to leadframes used when encapsulating semiconductor chips in molds such as pictured in Figure 2. The leadframe in the disclosed embodiment includes rails (60,62 Fig. 3B) that extend across inlets (70) and vents 74 formed in the mold. As is apparent from Figures 2 and 3B, the rails 60,62 form a gasket between the sections of the mold to hinder leakage of mold compound out of the mold cavities. It is also apparent from Figures 2 and 3B

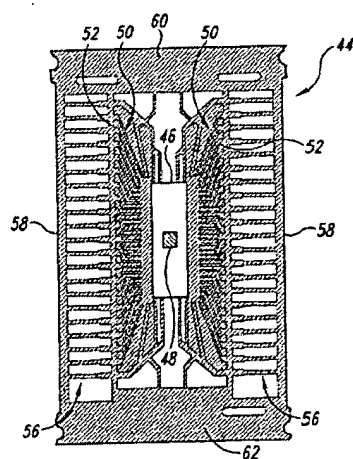


Fig. 3B

that when the leadframe is positioned within the mold, portions of the rails (60, 62) extend to either side of the inlets (70) and vents (74). In use, some of the mold compound leaks on to the rails (60, 62) and must be removed. In one disclosed embodiment, treated areas (88, Fig. 4)

are formed on the rails (60, 62) such that the mold compound does not adhere well to the rails (60, 62). In this manner, portions of the mold compound leaking onto the rails can be readily removed during a de-flashing step. As is apparent in Figure 4, the areas (88) occupy the majority of the length of the rails (60, 62) and are sufficiently wide to extend on either side of the inlets (70) and vents (74) when the leadframe is positioned within the mold.

Discussion of the Cited References

The cited references deal exclusively with the removal of portions of a mold compound remaining in the inlets and vents of a mold. The cited references do not provide any systems for dealing with flash caused by leakage out of a mold cavity. Chen, for example teaches only a process in which a "runner or gate is protected from the cleaning process to

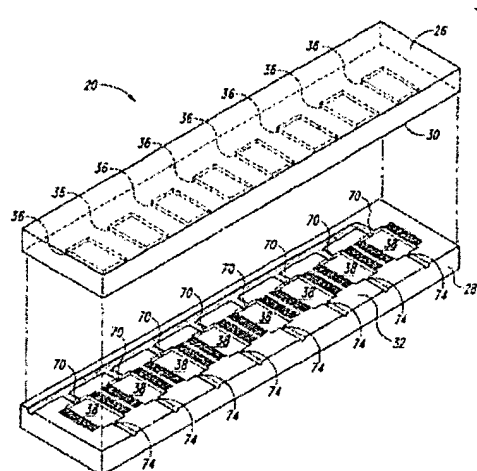


Fig. 2

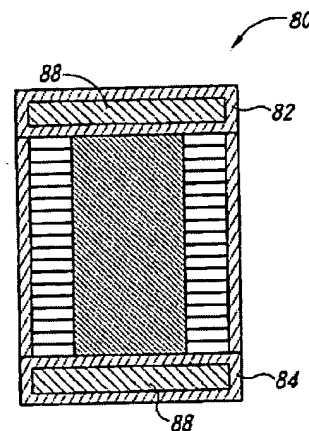


Fig. 4

maintain the original property of low adhesion.” Abstract. Osada likewise teaches only a portion of a frame member that “has on its upper surface a resin adhering rough surface portion for causing a portion of resin material filling the air vent to adhere to the surface of the frame member.” In each of these references, the relevant portion does not occupy both rails or a portion of any rail, other than at an inlet or vent.

It is readily apparent that the cited references do not teach treating frame rails to have low adhesion to mold compound in any area other than at a vent or inlet. The cited references further fail to discuss the problem of flash removal or suggest any means to solve it. The cited references therefore fail to teach or in any way suggest the disclosed embodiments.

Discussion of the Claims.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. None of the cited references teach or suggest the structures recited in independent claims 1, 21 and 41.

With respect to claim 1, none of the cited references teach, in combination with the other limitations of claim 1, a “mold compound adherence area the mold compound adherence area occupying a major portion of a longitudinal dimension of each of the pair of leadframe rails and adapted to abut a surface of the upper or lower mold section, the mold compound adherence area having reduced surface roughness that causes a mold compound to adhere to the mold compound adherence area less securely than portions of the leadframe outside the mold compound adherence area.”

With respect to claim 21, none of the cited references teach or suggest, in combination with the other limitations of claim 21, “a mold compound adherence area formed on each of the leadframe rails and extending adjacent the inlet and vent channels, the mold compound adherence area having reduced surface roughness that causes a mold compound to adhere to the mold compound adherence area less securely than portions of the leadframe outside the mold compound adherence area.”

With respect to claim 41, none of the cited references teach or suggest, in combination with the other limitations of claim 21, a “leadframe further including a respective mold compound adherence area formed on each of the leadframe rails and extending adjacent the inlet and vent channels, the mold compound adherence area having reduced surface roughness

that causes a mold compound to adhere to the mold compound adherence area less securely than portions of the leadframe outside the mold compound adherence area.”

Claims 4, 8, 10-12, 20, 22, 25, 31-33, 40, 42, 45, 49, 51-53, and 60 are allowable as dependent on allowable claims 1, 21, and 41, respectively.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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Enclosures:

Postcard
Check
Fee Transmittal Sheet (+copy)
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